THE CLAIMS

What is claimed is:

1. A method of identifying a molecule having selected properties for a particular application which comprises the steps of:

a) forming a base module having at least two structural diversity elements by reacting a first compound having at least one structural diversity element and a first reactive group with a second compound having at least one structural diversity element and a second reactive group which is different from said first reactive group, wherein the first and second reactive groups combine by a solution phase addition reaction;

b) producing a first array of at least two different base modules by repeating step a) at least one time while varying at least one of the structural diversity elements of the first or second compounds to produce at least one additional base module having at least two structural diversity elements, at least one of which differs from the structural diversity elements of the base module produced in step a); and

c) simultaneously screening the first array of base modules in accordance with a standard determined by said particular application to identify a first suitable compound for the particular application.

2. The method of claim 1 which further comprises producing a second array by forming additional base modules having structural diversity elements that are modified from those of the first suitable molecule; and

simultaneously screening the second array to determine a second suitable molecule for the particular application.

3. The method of claim 2 wherein the second array is produced by forming a base module having at least two structural diversity elements by reacting a first compound having at least one structural diversity element and a first reactive group, with a second compound having at least one structural diversity element

and a second reactive group, wherein the first and second groups combine by a solution phase addition reaction, and wherein the structural diversity elements are modified from those of the first suitable molecule.

4. The method of claim 3 which further comprises repeating the second array producing and screening steps.

5. The method of claim 1 wherein the first compound is an oxazolone compound having at least one structural diversity element attached thereto.

6. The method of claim 5 wherein the second compound is a nucleophile or carbonyl compound which is capable of reaction with the oxazolone and which contains at least one structural diversity element.

7. The method of claim 1 wherein the first compound is an aminimide-forming compound having at least one structural diversity element attached thereto.

8. The method of claim 7 which wherein the second compound is an ether compound which is capable of reaction with the aminimide-forming compound and which contains at least one structural diversity element.

9. The method of claim 1 which further comprises the selecting wherein each of the first and second structural diversity elements is one of the following:

an amino acid derivative;

a nucleotide derivative;

a carbohydrate derivative;

an organic moiety of an alkyl, cycloakyl, aryl, aralkyl or alkaryl group or a substituted or heterocyclic derivative thereof, or of a naturally occurring or synthetic organic structural motif, optionally containing a reporter element, an electrophilic group, a nucleophilic group or a polymerizable group; or

a macromolecular component.

10. The method of claim 1, which further comprises providing at least one of the first and second compounds with at least two structural diversity elements.

11. The method of claim 1 which further comprises providing each of the first and second compounds with at least two structural diversity elements.

12. The method of claim 10 wherein the at least two structural diversity elements of the first compound form a ring structure.

13. The method of claim 11 wherein the at least two structural diversity elements of the first or second compound form a ring structure.